Endangered Species Act Analysis Results and Discussion
Continental Tire the Americas, LLC
Mt. Vernon, Illinois

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MAR 14 2011

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Project 102601.0027

March 2011

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Executive Summary

On March 17, 2006 the United States Environmental Protection Agency (U.S. EPA) issued a brief to the Environmental Appeals Board stating that all permit applications triggering federal action, such as Prevention of Significant Deterioration (PSD), in delegated states (e.g., Illinois) are required to conduct an Endangered Species Act (ESA) Consultation if it is determined that there may be an effect on endangered or threatened species. Trinity Consultants, Inc. (Trinity) has prepared this ESA analysis in order to supplement the PSD permit application for the Continental Tire the Americas, LLC (CTTA) expansion project for its Mt. Vernon, Illinois facility. The purpose of this report is to provide the results of the deposition modeling and concentration calculations as well as an evaluation of the anticipated effect of the compounds of potential concern (COPCs) on endangered or threatened species of concern.

For all COPCs the concentration from background and project increases are less than the ecological screening level (ESL) for each media, the concentration increase from the project at the highest modeled concentration is less than 1 percent of the background concentration, or the concentration increase from the project at the highest modeled concentration is less than the toxicity reference value (TRV) for each media. Also, using the W126 statistic to calculate potential ozone effects on the area, the facility's impacts would be less than the proposed SIL of 0.28 ppm-hrs. Therefore, it has been determined that no impact to endangered or threatened species is likely to occur due to the emissions of these COPCs from the project.

1. INTRODUCTION

On March 17, 2006 the United States Environmental Protection Agency (U.S. EPA) issued a brief to the Environmental Appeals Board stating that all permit applications triggering federal action, such as Prevention of Significant Deterioration (PSD), in delegated states (e.g., Illinois) are required to conduct an Endangered Species Act (ESA) Consultation if it is determined that there may be an effect on endangered or threatened species. Continental Tire the Americas, LLC (CTTA) submitted an initial PSD application to the Illinois Environmental Protection Agency (IEPA) on January 5, 2011 for a permit for an expansion at its Mt. Vernon, Illinois manufacturing facility. In order to supplement the PSD permit application for this project with the information required for the ESA Consultation, Trinity Consultants, Inc. (Trinity) has performed deposition modeling and environmental media concentration calculations for a number of compounds of potential concern (COPCs). The purpose of this report is to provide the results of the deposition modeling and concentration calculations as well as an evaluation of the anticipated effect of the COPCs on endangered or threatened species of concern.

2. Background and Reference Information Used in Analysis

Ms. Rachel Rineheart of U.S. EPA Region 5 provided a recommended scope of analysis to follow in order to conduct the deposition modeling as well as evaluate the results obtained from the modeling. A copy of this recommended scope is included in Appendix A to this report. Based on the recommendation of U.S. EPA Region 5, the majority of the procedures and information that Trinity has used both for the deposition modeling and the follow-up evaluation closely followed the *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (SLERA protocol).[1] Although this protocol was originally designed specifically for hazardous waste combustion facilities, it has broad applicability in conducting modeling and evaluating the chemical effects on species of concern.

[1] U.S. EPA, Office of Solid Waste. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 1.* EPA 530-D-99-001A. August 1999.

3. COMPOUNDS OF POTENTIAL CONCERN

The pollutants described below were identified by U.S. EPA Region 5 as being COPCs to consider with respect to the CTTA project. Please note it is not anticipated that any dioxins or dioxin-like compounds will be emitted from the expansion project, therefore, these COPC's will not be further discussed. Emissions of volatile HAPs, heavy metals, and Polynuclear (Polycyclic) Aromatic Hydrocarbons (PAHs) were considered in this analysis. Potential emission rates of COPCs from new and modified emission units were calculated and used in the modeling and media concentration analysis for the purposes of this ESA Consultation. Based on previous ESA Consultations, CTTA expects the impact area for these COPCs to be within three kilometers from the center of the facility; as such, the scope of the analysis will focus on this expected area of impact.

3.1 PARTICULATE MATTER, HEAVY METALS, AND PAHS

Although particulate matter (PM) was included in the ESA recommended scope of analysis from U.S. EPA Region 5, this COPC as a whole was not analyzed for impacts to the species of concern. Instead, the most toxic components of PM were analyzed individually and compared to toxicity reference values. This is based on guidance from the SLERA protocol which states "PM dose-response information to evaluate risk of particulate matter to ecological receptors is limited. For this reason, U.S. EPA Office of Solid Waste [OSW] does not recommend that PM be evaluated as a separate COPC in a risk assessment. However, PM is useful as an indicator parameter for other contaminants…"[2] The protocol further states that PAHs and the presence of metals are generally the only concern with respect to PM.[3] Therefore, the following heavy metals and PAHs were considered for the analysis:

- Chromium,
- Benz(a)anthracene,
- Benzo(a)pyrene,
- Benzo(b)fluoranthene,
- Benzo(k)fluoranthene,
- Chrysene,
- Dibenz(a,h)anthracene,
- Indeno(1,2,3-cd)pyrene, and
- Naphthalene.

3.1.1 PAH AND HEAVY METAL EMISSION RATES

CTTA does not have any stack test data for PAHs and heavy metals. Therefore, emission rates for the PAHs and chromium were calculated using values from the U.S. EPA's AP-42 emission factors documents.[4,5] It should be noted that stack test data for PM emissions from other CTTA

[2] U.S. EPA, Office of Solid Waste. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 1.* EPA 530-D-99-001A. August 1999. Pg. 2-67

[3] U.S. EPA, Office of Solid Waste. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 1.* EPA 530-D-99-001A. August 1999. Pg. 2-50

[4] U.S. EPA, Office of Air Quality Planning and Standards, AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Chapter 1 – External Combustion Sources, Section 1.4 – Natural Gas Combustion (July 1998).

facilities indicate that the AP-42 factors significantly overestimated actual PM emissions. Given that heavy metals and PAHs are a subset of PM, these emissions may also be drastically overestimated. In addition, these COPC's are not intentionally added by CTTA during the tire manufacturing process, but may be present as trace components of raw materials.

3.1.2 BACKGROUND CONCENTRATIONS AND ECOLOGICAL SCREENING LEVELS

Soil, water, and sediment concentrations for PAHs and heavy metals were calculated using the methodology outlined in Section 3.11 and Appendix B of the SLERA protocol. When available, chemical specific data were obtained from Appendix A of the protocol. Chromium emissions from the project were conservatively considered to be 100 percent hexavalent chromium due to the increased toxicity for chromium in this valence state. All recommended default values listed in Appendix B of the SLERA protocol were used in determining media concentrations. Detailed calculations performed for determining media concentrations are included in Appendix B to this report.

For PAHs and heavy metals, background concentrations in soil were obtained from a United States Geological Survey (USGS) study in the Chicago area.[6] This is considered conservative as the expected background concentrations for soil in the Chicago area are much higher than what would be expected in Jefferson County. Background concentrations for water and sediment were obtained from the Illinois Environmental Protection Agency (IEPA) in a request for water and sediment data for Jefferson County.[7] Water data from the water body just south of the CTTA facility were not available; therefore, data from Casey Fork near Mt. Vernon were used. Ecological screening levels for PAHs and chromium were provided by U.S. EPA Region 5.[8]

3.2 VOLATILE HAZARDOUS AIR POLLUTANTS

There are 82 different volatile HAPs potentially emitted from the tire manufacturing process. In order to evaluate the potential impacts of this group, five compounds were selected and analyzed. The selected HAPs are expected to have the highest emission rates of any pollutants within the volatile HAP category. These five pollutants represent approximately 98 percent of the potential volatile HAP emissions from the tire manufacturing process. The volatile HAPs that were selected for analysis were:

- Carbon Disulfide,
- Hexane,
- Benzene,
- Toluene, and
- Methylene Chloride.

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[5] U.S. EPA, Office of Air Quality Planning and Standards, AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources, Chapter 4 – Evaporative Loss Sources, Section 4.12 – Manufacture of Rubber Products (Draft Section November 2008).

[6] Kay, R.T., et. al, *Concentrations of PolynuclearAromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-2002.* United States Geological Survey, 2003

[7] Requested on XX/XX/XXXX by Mr. Jeremy Schewe of Falcon Engineers of Mr./Ms. XX of the IEPA, received 1/19/2011.

[8] U.S. EPA Region 5 Waste Division, RCRA Corrective Action Guidance and Policy Documents, Ecological Screening Levels, August 22, 2003 available at http://www.epa.gov/reg5rcra/ca/guidance.htm.

3.2.1 VOLATILE HAPS INCLUDED FOR MODELING ANALYSIS

Hexane and carbon disulfide were not included in the modeling evaluation as neither compound remains in soil or water for very long; therefore, likely impacts are negligible. Benzene, methylene chloride, and toluene demonstrate the next highest toxicity-weighted emission scores. Therefore, these four compounds were evaluated in the emissions modeling in terms of possible impacts to soils, water, and sediment. All six of the volatile compounds are discussed briefly below, however only benzene, methylene chloride, and toluene have been evaluated in the model of emissions impacts.

3.2.1.1 CARBON DISULFIDE

Carbon disulfide evaporates rapidly when released to the environment. Carbon disulfide does not stay dissolved in water very long, and also moves quickly through soils. Carbon disulfide reacts with the hydroxyl (OH) radical in the atmosphere, with the effective rate constant depending on oxygen (O_2) concentration and total pressure. Based on the literature rate constant at one atmosphere of air, the calculated half-life of carbon disulfide due to its reaction with the OH radical is about eight days. Its reaction products include carbonyl sulfide and sulfur dioxide. Carbon disulfide is non-persistent in water, with a half-life of less than two days. About 99.8 percent of carbon disulfide will eventually end up in air; the rest will end up in the water.[9] Due to the low persistence of carbon disulfide in the environment as well as the lack of available ecological toxicity data, carbon disulfide was not evaluated for deposition impacts for the purposes of this ESA report.

3.2.1.2 HEXANE

Hexane has very low solubility in water and high volatility, and will usually be rapidly transported to the atmosphere without major damage to any biota. Hexane is typically carried in the air. If released to soil, hexane will usually quickly evaporate in one to two days to the atmosphere. Hexane is only slightly soluble in water, but is readily absorbed by the lipid phase (fatty parts) of aquatic organisms, which can result in transport in the environment.[10] Due to the low persistence of hexane in the environment as well as the lack of available ecological toxicity data, hexane was not evaluated for deposition impacts for the purposes of this ESA report.

3.2.1.3 METHYLENE CHLORIDE

Methylene chloride, also known as dichloromethane, is a clear and colorless organic solvent that is slightly soluble in water. Methylene chloride quickly evaporates when exposed to the air and because of its short life expectancy (130

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[9] National Pollutant Inventory: Substances: *Carbon disulfide: Environmental Effects.* Australian Government, Department of Sustainability, Environment, Water, Population and Communities. Available online at http://www.npi.gov.au/substances/carbon-disulfide/environmental.html accessed on [12/11/10].

[10] National Pollutant Inventory: Substances: *n-Hexane: Environmental Effects.* Australian Government, Department of Sustainability, Environment, Water, Population and Communities. Available online at http://www.npi.gov.au/substances/hexane/environmental.html accessed on [12/13/10].

days) it is expected to be confined to the local area around its source.[11] If it is released into the soil, this material may leach into groundwater, though it will quickly evaporate from water as well.[12] Bio-accumulation is not expected, and methylene chloride has low acute toxicity to aquatic organisms.[13]

Methylene chloride is expected to produce the highest offsite soil and vegetation impacts. Therefore, CTTA proposes a chronic screening threshold for potential adverse impacts to soils from methylene chloride exposure of 4,050 μg/kg over the lifetime of the CTTA's operations.[14] No acute ecological screening thresholds for methylene chloride deposition were found in the literature review; therefore, CTTA has only evaluated chronic impacts for this COPC.

3.2.1.4 BENZENE

Benzene has a high acute toxic effect on aquatic life, where long-term effects on marine life can mean shortened lifespan, reproductive problems, lower fertility and changes in appearance or behavior. Absorption through leaf stomata or cell walls can cause death in plants and roots and damage to the leaves of many agricultural crops.[15] Benzene is carried via the atmosphere. When it comes into contact with soil, benzene will usually breakdown quickly. It can be mobile in soil, however, and may contaminate groundwater. Benzene is only slightly soluble in water, but is readily absorbed by the lipid phase (fatty parts) of aquatic organisms, which can result in transport in the environment.[16]

Benzene is expected to produce the second-highest offsite soil and vegetation impacts. Therefore, CTTA proposes a chronic screening threshold for potential adverse impacts to soils from benzene exposure of 255 μg/kg over the lifetime of CTTA's operations.[17] No acute ecological screening thresholds for benzene deposition were found in the literature review; therefore, CTTA has only evaluated chronic impacts of this COPC.

3.2.1.5 TOLUENE

Toluene evaporates when exposed to the atmosphere, and is broken down within a few days into other chemicals (benzaldehyde and cresol, which are harmful to humans). It evaporates quickly from both soil and water surfaces, where residual

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[11] National Pollutant Inventory: Substances: *Dichloromethane: Environmental Effects.* Australian Government, Department of Sustainability, Environment, Water, Population and Communities. Available online at http://www.npi.gov.au/substances/dichloromethane/environmental.html accessed on [01/11/11].

[12] J.T. Baker, 2008. *Environmental Health & Safety, MSDS Number: M4420* (Methylene Chloride). Material Safety Data Sheets, Mallinckrodt Baker, Inc, Phillipsburg, New Jersey.

[13] U.S.EPA, 2000. Methylene Chloride (Dichloromethane) Hazard Summary. U.S.EPA Technology Transfer Network Air Toxics Web Site, revised in January 2000. Available online at http://www.epa.gov/ttn/atw/hlthef/methylen.html accessed on [1/11/11].

[14] U.S. EPA Region 5 RCRA Ecological Screening Levels

[15] Flagler, *Recognition of Air Pollution Injury to Vegetation*

[16] National Pollutant Inventory: Substances: *Benzene: Environmental Effects.* Australian Government, Department of Sustainability, Environment, Water, Population and Communities. Available online at http://www.npi.gov.au/substances/benzene/environmental.html accessed on [12/13/10].

[17] U.S. EPA Region 5 RCRA Ecological Screening Levels

toluene on water and soil will be digested by bacteria. Toluene that makes its way into soils, and does not evaporate, may move through the soil and enter groundwater. Toluene has caused membrane damage to the leaves in plants. It has also been demonstrated that toluene has a moderate chronic toxicity to aquatic life. Industrial emissions of toluene can produce elevated concentrations in the atmosphere around the source. Because of its short life expectancy in the atmosphere toluene is expected to be confined to the local area within which it is emitted.[18]

Toluene is expected to produce the third-highest offsite soil and vegetation impacts. Therefore, CTTA proposes a chronic screening threshold for potential adverse impacts to soils from toluene exposure of 5,450 µg/kg over the lifetime of the CTTA's operations.[19] No acute ecological screening thresholds for toluene deposition were found in the literature review; therefore, CTTA has only evaluated chronic impacts of this COPC.

3.2.2 VOLATILE HAP EMISSION RATES

Similar to the emissions of heavy metals, CTTA does not have any stack test data for emissions of volatile HAPs. Therefore, emission rates for these COPC's were calculated using values from the U.S. EPA's AP-42 emission factors documents as well.[20,21]

3.2.3 BACKGROUND CONCENTRATIONS AND ECOLOGICAL SCREENING LEVELS

Soil, water, and sediment concentrations for the volatile HAPs were calculated using the methodology outlined in Section 3.11 and Appendix B of the SLERA protocol. When available, chemical specific data were obtained from Appendix A of the protocol. All recommended default values listed in Appendix B of the SLERA protocol were used in determining media concentrations. Detailed calculations performed for determining soil, water, and sediment concentrations are included in Appendix B to this report.

For the volatile HAPs, considerably less data on background concentrations and ESLs were available. For background concentrations in the soil, data on remediation action levels for industrial/commercial properties from the IEPA Toxicity Assessment Unit were used for several volatile HAPs.[22,23] Remediation action levels for industrial/commercial properties were chosen to

[18] National Pollutant Inventory: Substances: *Toluene: Environmental Effects*. Australian Government, Department of Sustainability, Environment, Water, Population and Communities. Available online at http://www.npi.gov.au/substances/toluene/environmental.html accessed on [12/13/10].

[19] U.S. EPA Region 5 RCRA Ecological Screening Levels

[20] U.S. EPA, Office of Air Quality Planning and Standards, AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Chapter 1 – External Combustion Sources, Section 1.4 – Natural Gas Combustion (July 1998).

[21] U.S. EPA, Office of Air Quality Planning and Standards, AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources, Chapter 4 – Evaporative Loss Sources, Section 4.12 – Manufacture of Rubber Products (Draft Section November 2008).

[22] IEPA, Toxicity Assessment Unit. *Soil Remediation Objectives for Industrial/Commercial Properties, Non-TACO Chemicals (Table B)*. October 1, 2004 and July 1, 2007.

[23] 35 Illinois Administrative Code, Section 742.Appendix B.Table B: Tier 1 Soil Remediation Objectives for Industrial/Commercial Properties.

use as background data rather than those for residential properties, since the levels for industrial/commercial properties are higher. Due to the fact that the background levels are added to the project increase prior to comparing to the ESL, it is more conservative to use the higher levels. No background concentrations were available from the USGS National Water Information System, therefore, background concentrations for volatile HAPs in water were obtained from IEPA groundwater remediation objectives.[24] The ESLs for most of the volatile HAPs were available from the data provided by USEPA Region 5.

3.3 Ozone Exposure

Ozone (O_3) is not generally directly emitted from pollutant sources such as tire manufacturing facilities, but instead, ozone forms in a reversible reaction between oxygen, VOM, and NO_X. Stagnant air masses will further stimulate the formation of low atmospheric ozone, which can then come into contact with the surface of plant leaves.[25] The ozone path of entry into the leaf is through the stomata.[26] Leaves of dicotyledonous plants (such as soybeans) are most sensitive to ozone between 65-95 percent of their final size, as this correlates with the stomata becoming fully functional and the formation of intracellular spaces so that ozone can enter the leaves and reach target sites.[27]

The plasma or cell membranes suffer the most injury in the leaves of plants, and this is characterized by changes in permeability and leakiness of cell membranes to important ions such as potassium.[28] Injured parts of the leaves begin to swell in the epidermis, becoming water soaked and oily, due to the increased permeability of cell membranes and the subsequent movement of cellular water into the intracellular spaces.[29] On broad-leaved plants, ozone induced foliar damage/injury appear as areas of chlorosis, pigment accumulation, and necrosis on the upper surface of the leaf.[30, 31]

High concentrations (>150 ppb) of ozone in short-term exposures to plants can cause acute visible foliar injury, while long-term chronic exposures to lower concentrations (50-80 ppb) can cause some of the above mentioned physiological alterations, resulting in chlorosis, premature senescence, and in growth and yield reductions.[32] Growth reduction in soybeans has been recorded before the appearance of visible symptoms and injury due to ozone exposure.[33]

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[24] IEPA, Toxicity Assessment Unit, *Groundwater Remediation Objectives for Chemicals Not Listed in TACO.* October 1, 2004 and July 1, 2007.

[25] Flagler, *Recognition of Air Pollution Injury to Vegetation*

[26] Runeckles, V.C. 1992. *Uptake of ozone by vegetation.* In Surface Level Ozone Exposures and Their Effects on Vegetation, ed. A.S. Lefohn. Lewis Publishers, Inc., Chelsea, MI, pp. 157-188.

[27] Tingey, D.T., Fites, R.C., and Wickliff, C. 1973. *Foliar sensitivity of soybeans to ozone as related to several leaf parameters.* Environmental Pollution, Volume 4, pp. 183-192.

[28] Wellburn, A. 1994. Air Pollution and Climate Change: The Biological Impact. John Wiley & Sons, New York, NY 268 pp.

[29] Smith, W.H. 1970. Tree Pathology. Academic Press, London, UK, 309 pp.

[30] Koukol, J. and Dugger, W.M., Jr. 1967. *Anthocyanin formation as a response to ozone and smog treatment in Rumex crispus L.* Plant Physiology, Volume 42, pp. 1023-1024.

[31] Howell, R.K. 1974. *Phenols, ozone and their involvement in pigmentation and physiology of plant injury.* In Air Pollution Effects on Plant Growth, ed. W.M. Dugger, ACS Symposium Ser. 3, American Chemical Society, Washington, D.C., pp. 94-105.

[32] Flagler, *Recognition of Air Pollution Injury to Vegetation*

[33] Reiling, K. and Davidson, A.W. 1992*a. The response of native, herbaceous species to ozone: Growth and fluorescens screening.* New Phytology, Volume 120, pp. 29-37.

Species common in Jefferson County that are relatively sensitive to ozone include corn, soybeans, wheat, Green Ash, Walnut, American Sycamore, and Black Birch.[34] Some of the species listed are possible habitats for the Indiana Bat and thus require consideration. The exposure threshold for injury to sensitive plants to ozone in the impact area for CTTA, based on established threshold exposure levels and peer-reviewed literature, is shown to be 98-157 $\mu g/m^3$, 294 $\mu g/m^3$ for other plants, 294 $\mu g/m^3$ for soils, and 294 $\mu g/m^3$ for open water for a range of 1-hour and 24-hour periods (see Appendix D, Table D-1.3 for details).[35] Since each of these species may exhibit differing responses to acute and chronic levels of elevated ambient ozone concentrations, establishing a screening threshold based on a single short-term and annual concentration that will be protective of all species is not possible

Therefore, CTTA proposes an exposure index as the form of the screening threshold for direct ozone exposure to plants. Due to the varied conditions for ozone exposure experiments and the large number of plant species that have been studied, U.S. EPA concluded in its recent proposal to modify the secondary ozone National Ambient Air Quality Standard (NAAQS) that biologically relevant exposure indices which cumulate differentially weighted hourly ozone concentrations are the "best candidates for relating exposure to plant growth responses" rather than expressing the ozone NAAQS as a single concentration not to be exceeded.[36] From among the various forms of ozone exposure indices utilized in Europe and in peer-reviewed scientific studies, U.S. EPA selected the W126 exposure index which uses a sigmoidal weighting function to assign a weighting factor to each hourly ambient ozone concentration within the 12-hour daylight period from 8 AM to 8 PM. The weighted hourly ozone concentrations are then used to calculate a daily ozone index according the following formula:

$$daily\ W126 = \sum_{i=8am}^{i<8pm} w_{C_i} C_i.\ where\ C_i = hourly\ O_3\ at\ hour\ i, and\ w_C = \frac{1}{1+4403e^{-126C}}.$$

where,
daily W126 = daily ozone index
w_{ci} = weighting factor for hour i = 1 / (1 + $4403e^{-126C_i}$)
C_i = hourly ambient ozone concentration (ppm)

The daily ozone index values are then summed over each month within the ozone season (i.e., May 1st to September 30th), and the highest consecutive three month sum within the ozone season is determined. The form of the proposed secondary ozone NAAQS is the three-year average of this highest three-month W126 statistic within the ozone season, and the proposed level of the standard is within the range of 7 to 15 ppm- hours.

CTTA utilized a screening threshold for assessing adverse impacts from direct ozone exposure to plants of 7 ppm-hours (i.e., the lowest value in the range of levels proposed by U.S. EPA) based on the same form of the W126 statistic proposed by U.S. EPA for the secondary ozone NAAQS. In the preamble to the proposed ozone NAAQS revisions, U.S. EPA states the following with respect to its decision-making process for establishing the level of the secondary ozone NAAQS:

Based on the above, the Administrator finds that the types of information most useful in informing the selection of an appropriate range of protective levels is appropriately focused on information regarding exposures and responses of sensitive trees and other native species known or anticipated to

34 Flagler, *Recognition of Air Pollution Injury to Vegetation*

35 *Ibid.*

36 75 FR 2938, National Ambient Air Quality Standards for Ozone, Proposed Rule, January 19, 2010.

occur in protected areas such as Class I areas or on lands set aside by States, Tribes and public interest groups to provide similar benefits to the public welfare, for residents on those lands, as well as visitors to those areas.

Therefore, CTTA believes the proposed secondary NAAQS will be protective of even the most sensitive plant species in CTTA's expected impact area (3km from the center of the facility), and the proposed secondary NAAQS is expected to provide the appropriate basis for the screening threshold.

4. General Modeling Assumptions

The latest version of the AMS/EPA Regulatory Model (AERMOD) model, Version 09292, was used with the *BREEZE™ AERMOD Suite* software, provided by Trinity, to estimate maximum ground-level concentrations, wet deposition, and dry deposition of metals and PAHs, and gaseous hazardous air pollutants (HAP) due to emissions from the expansion project. Modeling with AERMOD was performed using the non-regulatory option enabled in order to utilize the deposition algorithms. CTTA has followed the modeling protocol submitted to the IEPA on December 13, 2010 to Mr. Matt Will. Additional data and a brief summary of the modeling options are presented below.

4.1 UTM Coordinate System

In all modeling analysis input and output data files, the locations of emission sources, structures, and receptors are represented in the Universal Transverse Mercator (UTM) coordinate system. The Mt. Vernon area of south-central Illinois is located in UTM Zone 16. The center of the CTTA property is located near UTM coordinates 334.600 km East and 4,239.800 km North. All building, tank, emission point, and fence line locations for Continental are converted to equivalent UTM coordinates. All UTM location information was input into the model using consistent datum system (i.e., NAD83).

4.2 Sources Modeled

Emission points that were considered in the analysis were all new emission units, all existing emission units that will be modified, and any existing units with associated emissions increases as a result of the expansion project. The modeled emission rate for the new sources was the potential emission rate for each source. The modeled emission rate for the modified and associated emissions sources included the potential incremental increase attributable to the modification.

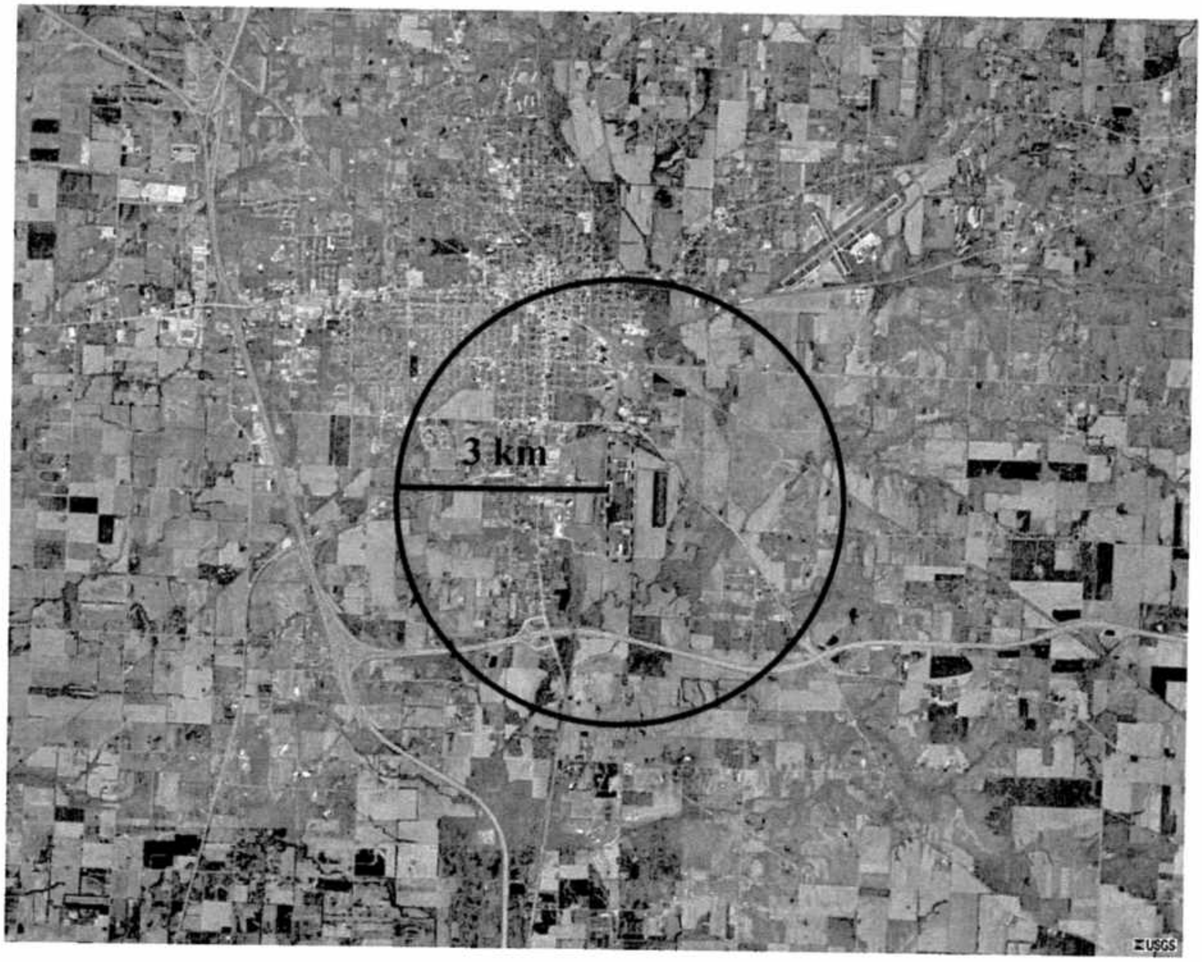
4.3 Land Use and Selection of Dispersion Option

The land-use analysis was based on information provided by the IEPA for meteorological processing. The provided information was input into stage 3 of the U.S. EPA's AERMET processing program for Evansville, IN. This is discussed further in Section 4.6 below. Also, the land-use in the surrounding 3 km (the expected impact level) was used for gaseous deposition modeling as explained in Section 4.8.2. Figure 4-1 shows the land-use with the expected impact area annotated in the figure.

4.4 Terrain

The base elevation of the facility is approximately 440.5 feet above mean sea level as determined from the 7.5 minute United States Geological Survey (USGS) maps for the site (Mt. Vernon, Illinois) and from facility sources. Terrain elevations in the area of the facility are relatively flat. Terrain elevations were input into the air quality model using Digital Elevation Model (DEM) data for the facility and surrounding area. AERMAP was used to calculate the elevation and hill height scale for each receptor which is required to allow AERMOD's terrain algorithms to properly determine the impact of each source at each receptor.

FIGURE 4-1 - LAND USE MAP



4.5 RECEPTOR GRIDS

Ground-level concentrations were calculated with receptors set up in Cartesian grids and at receptors placed along the property line. All receptors were used to determine the location of the estimated pollutant impacts for the various ecological type assessments. Nested fine (100 m spacing), medium-fine, medium, and coarse (1 km spacing) Cartesian grids covered a region extending from all edges of the CTTA property boundary to the edges of the county. The grids were defined as follows:

1. **Fence Line Receptors:** Fence line receptors will be arranged around the outer border of the CTTA property and consist of evenly-spaced receptors 50 meters apart.

2. **100m Cartesian Grid:** A fine grid will be arranged around the facility at a 100-meter spacing extending from the fence lines to 2.5 km from the center of the facility.

3. **250m Cartesian Grid:** A medium fine grid will be arranged around the facility at a 250-meter spacing extending from 2.5 km to 5 km from the center of the facility.

4. **500m Cartesian Grid:** A medium grid will be arranged around the facility at a 500-meter spacing extending from 5 km to 10 km from the center of the facility.

5. **1000m Cartesian Grid:** A coarse grid will be arranged around the facility at a 1,000-meter spacing extending from 10 km from the center of the facility to the extents of Jefferson County.

4.6 METEOROLOGICAL DATA

Meteorological data for use in AERMOD was processed using the AERMOD meteorological preprocessor (AERMET) for the years 2005 through 2009. The 2005 through 2009 raw meteorological data for use in AERMET included surface meteorological data (wind speed, wind direction, temperature, and cloud cover) from the Evansville Regional, IN (KEVV) station and upper air data from Lincoln, IL (KILX).

Evansville was chosen because it was the closest, most representative meteorological station with PSD-quality data capture. Several stations in the surrounding area were reviewed including Mt. Vernon AWOS (KMVN), Salem Leckrone Airport (KSLO), Marion Regional Airport (KMWA), and Belleville Scott AFB (KBLV). Only Evansville was able to meet the high standards necessary for PSD modeling (i.e., the availability of data for the station was greater than 90 percent per quarter[37]). Also, the U.S. EPA's modeling guidelines recommend using the most recent, readily available 5-year period in a meteorological data analysis.[38]

The meteorological data were processed using default AERMET options and built-in AERMET quality assurance and data substitution options. The last portion of AERMET, Stage 3, combined the observational meteorological data with the surface land use characteristics to calculate the micrometeorological input parameters required by the AERMOD model. The IEPA calculated the surface characteristics according to U.S. EPA procedures (using AERSURFACE) and provided this information for the Evansville Regional Airport for this analysis. These parameters are output in the .sfc and .pfl files that compose an AERMOD ready dataset. One file is a file of surface scalar parameters and the other file consists of vertical profiles of meteorological data.

4.7 BUILDING WAKE EFFECTS (DOWNWASH)

The purpose of a building downwash analysis is to determine if the plume discharged from a stack will become caught in the turbulent wake of a building (or other structure), resulting in downwash of the plume. The downwash of the plume can result in elevated ground-level concentrations.

The U.S. EPA provides guidance for determining whether building downwash will occur in *Guideline for Determination of Good Engineering Practice Stack Height.*[39] The minimum stack height not subject to the effects of downwash (called the Good Engineering Practice or GEP stack height) is defined by the following formula:

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[37]Environmental Protection Agency, 2000. Meteorological Monitoring Guidance for Regulatory Applications. EPA-454/R-99-005

[38]Federal Register Vol. 68, No. 72; *Revision to the Guideline on Air Quality Models: Adoption of a Preferred Long Range Transport Model and Other Revisions; Final Rule*, April 15, 2003.

[39]EPA, Office of Air Quality Planning and Standards. *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised).* Research Triangle Park, North Carolina. EPA 450/4-80-023R. June, 1985.

$GEP = H + 1.5L$

Where: GEP	=	the minimum GEP stack height
H	=	the height of the structure
L	=	the lesser dimension of the structure (height or projected width)

Stacks located more than 5L from any building are not subject to the effects of building downwash. The Building Profile Input Program (BPIP) with Plume Rise Model Enhancements (PRIME) was used to determine the building downwash characteristics for each stack in 10-degree directional intervals. The PRIME version of BPIP features enhanced plume dispersion coefficients due to turbulent wake and reduced plume rise caused by a combination of the descending streamlines in the lee of the building and the increase entrainment in the wake. For PRIME downwash analyses, the building downwash data included the following parameters for the dominant building: building height, building width, building length, x-dimension building adjustment, and y-dimension building adjustment.

4.8 Additional Information Related to Deposition Modeling

AERMOD was used to compute deposition values considering two different approaches determined by whether the COPC emissions were in particulate or gaseous form. Particulate COPCs include all heavy metals and PAHs with a vapor fraction (Fv) of less than 0.05 (i.e., chromium, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene).[40] Gaseous COPCs include all applicable volatile HAPs and PAHs with an Fv of 1.0 (i.e., methyl chloride, benzene, toluene, and naphthalene). A combination of the two deposition models were used for all PAHs with an Fv between 0.05 and 1.0 (i.e., benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene). Details on the individual COPC modeling and the parameters used to specify the wet and dry particulate and gaseous deposition are given below.

4.8.1 Particle Deposition

Particle deposition may be calculated in AERMOD by either Method 1 or Method 2. Method 1 is used when a significant fraction (greater than about 10 percent) of the total particulate mass has a diameter of 10 μm or larger and the particle size distribution is well known. Method 2 is used when the particle size distribution is not well known and when a small fraction (less than 10 percent of the mass) is in particles with a diameter of 10 μm or larger. In the case of the CTTA deposition modeling, Method 2 was most appropriate. When deposition is selected in AERMOD, the modeling algorithms account for the gravitational settling (deposition) and removal by deposition of particulates (plume depletion, i.e., conservation of mass in the plume). In addition to hourly precipitation data (input through the use of the AERMET-generated meteorological data sets), these algorithms require the fine mass fraction and mean particle diameter for each emission source.

The Method 2 inputs are described below and also summarized in Table 4-1. Particulate from the mixers was assumed to be coarse particle carbon black. The fine mass fraction and mean particle diameter for carbon black was calculated from AP-42 Section 6.1. Particulate from the grinders and buffers was estimated based on AP-42 Appendix B for mechanically generated particles. Manufacturer's data for the collection efficiency of each particle size were used for emissions from

[40] U.S. EPA, Office of Solid Waste. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 1.* EPA 530-D-99-001A. August 1999. Pg. 3-15

the cyclone. The fine mass fraction and mean particle diameter was calculated using the procedure in Figure B.2-2 of AP-42 Appendix B.2. Particulate data from the extruders and the boiler were not available, so the data was obtained from U.S. EPA model support documents.[41]

The carbon black sources were not modeled because carbon black's MSDS (CAS 1333-86-4) shows carbon black as 100% with no appreciable HAPs (which would appear at 0.1%). In the same manner, the emissions from the cooling tower were not modeled.

TABLE 4-1 – AERMOD INPUTS FOR METHOD 2 PARTICLE SIZES

Source Category	Chromium Mean Particle Size (µm)	Chromium Percent Fine	PAHs Mean Particle Size (µm)	PAHs Percent Fine	Source
Mixers	0.4	100%	0.4	100%	AP-42, Chapter 6.1 (Carbon Black)
Extruders	1.2	55%	0.1	93%	ANL Report, Appendix B
Boiler	1.2	55%	0.1	93%	ANL Report, Appendix B
Grinding	4.5	35%	4.5	35%	Calculated from AP-42, Appendix B.2

4.8.2 GASEOUS DEPOSITION

Gaseous deposition requires additional source parameters for dry and wet deposition of gaseous COPCs, including the diffusivity in air, diffusivity in water, cuticular resistance, and Henry's Law constant. Values for gaseous COPCs were based on U.S. EPA model support documents.[42]

The gaseous deposition algorithms also require additional inputs in the AERMOD control options, including seasonal and land use parameters. Seasonal categories were assigned to each calendar month based on local observations. Predominant land use categories were assigned for each 10-degree wind sector based upon a recent aerial photograph of the facility and surrounding area. These inputs are summarized in Table 4-2 and Table 4-3 below.

TABLE 4-2 – AERMOD INPUTS FOR SEASONAL CATEGORIES

Month	Seasonal Category
January	3 - Late autumn after frost and harves, or winter with no snow
February	3 - Late autumn after frost and harves, or winter with no snow
March	5 - Transitional spring with partial green coverage and short annuals
April	5 - Transitional spring with partial green coverage and short annuals
May	1 - Midsummer with lush vegetation
June	1 - Midsummer with lush vegetation
July	1 - Midsummer with lush vegetation
August	1 - Midsummer with lush vegetation
September	1 - Midsummer with lush vegetation
October	2 - Autumn with unharvested cropland

[41] Appendix B from M.L. Wesely, P.V. Doskey, and J.D. Shannon. *Deposition Parameterizations for the Industrial Source Complex (ISC3) Model.* Argonne National Laboratory. ANL/ER/TR-01/003. June, 2002.

[42] Appendices C and D from M.L. Wesely, P.V. Doskey, and J.D. Shannon. *Deposition Parameterizations for the Industrial Source Complex (ISC3) Model.* Argonne National Laboratory. ANL/ER/TR-01/003. June, 2002.

November	3 - Late autumn after frost and harves, or winter with no snow
December	3 - Late autumn after frost and harves, or winter with no snow

TABLE 4-3 – AERMOD INPUTS FOR LAND USE CATEGORIES

Wind Direction (Degrees from North)	Land Use Category
10	2 - Agricultural land
20	2 - Agricultural land
30	2 - Agricultural land
40	2 - Agricultural land
50	2 - Agricultural land
60	2 - Agricultural land
70	2 - Agricultural land
80	2 - Agricultural land
90	2 - Agricultural land
100	2 - Agricultural land
110	2 - Agricultural land
120	2 - Agricultural land
130	2 - Agricultural land
140	2 - Agricultural land
150	2 - Agricultural land
160	2 - Agricultural land
170	2 - Agricultural land
180	2 - Agricultural land
190	2 - Agricultural land
200	2 - Agricultural land
210	2 - Agricultural land
220	2 - Agricultural land
230	2 - Agricultural land
240	2 - Agricultural land
250	2 - Agricultural land
260	2 - Agricultural land
270	2 - Agricultural land
280	2 - Agricultural land
290	5 - Suburban areas, grassy
300	5 - Suburban areas, grassy
310	5 - Suburban areas, grassy
320	5 - Suburban areas, grassy
330	5 - Suburban areas, grassy
340	5 - Suburban areas, grassy
350	5 - Suburban areas, grassy
360	5 - Suburban areas, grassy

5. SPECIES OF CONCERN

The species of concern include all endangered or threatened wildlife (animals and plants) that are known or believed to occur in Jefferson County, Illinois. The list of endangered or threatened wildlife was obtained from the U.S. Fish and Wildlife Service (FWS) for Jefferson County.[43] Five species were included in the report with only two species being threatened or endangered, these included:

- Piping Plover (*Charadrius melodus*), and
- Indiana Bat (*Myotis sodalis*).

5.1 PIPING PLOVER

The Piping Plover (*Charadrius melodus*) is on the U.S FWS list of endangered species.[44] Potential nesting habitat is in a few counties in northern Illinois along the shoreline of Lake Michigan. Several locations in Jefferson County are known to be resting areas for the Piping Plover during migration. Preferred migratory resting areas include habitat similar to nesting areas, such as sandy shorelines at the margins of large lakes, and streams. Since Jefferson County has approximately four percent surface water (See Appendix D, Table 1.3), most of the area surrounding the CTTA facility would not generally be considered good habitat for the piping plover. However, there are several lakes, reservoirs, and streams in the county (See Appendix D, Table 1.4) which would provide the open, sandy habitat for migratory breaks. The closest potential area is 3.1 kilometers to the north northwest of CTTA at Veterans Memorial Park which has a small lake; however, the lake has no shoreline or sandy area as the edge of the lake has a walking trail all the way around it. The next closest potential area is 3.7 kilometers to the north northwest of the facility at Optimist Park which has a small stream; however, the stream is a grassy stream which also has no shoreline or sandy parts. The next closest potential area is 5.8 kilometers south of the facility at the Mt. Vernon State Game Farm which has several small lakes and streams. Areas around Rend Lake, within 17 km west southwest of the facility, including the Wayne Fitzgerall State Park, Rend Lake State Wildlife Refuge, and Rend Lake State Waterfowl Management Area, contain appropriate migratory habitat for the Piping Plover. Sparsely vegetated, sandy shoreline is available in several locations around Rend Lake, as well as some of the other lakes mentioned above where the Piping Plover might be found during the migratory seasons. All of these potential resting locations where the Piping Plover may be found are outside the expected impact area of three kilometers. As such, considerations for the likely adverse impacts of any changes to the CTTA facility will not impact the Piping Plover's habitat due to the limited about of time that the species are found in the area.

5.2 INDIANA BAT

The Indiana Bat (*Myotis sodalist*) is on the U.S. FWS list of endangered species.[45] Potential habitat is state-wide, however, no known populations occur in Jefferson County where the CTTA facility is located. Habitat for the Indiana Bat includes caves and trees. Most of the area surrounding the CTTA facility in

[43] U.S. Fish & Wildlife Service, Endangered Species Program, *Species Report for Jefferson County, Illinois*. Available online at http://www.fws.gov/endangered/ accessed on [1/5/11].

[44] U.S. Fish & Wildlife Service, *Endangered Species: Illinois, County Distribution of Federally Threatened, Endangered, Proposed and Candidate Species*, last updated: November 1, 2010. Available online at http://www.fws.gov/midwest/endangered/lists/pdf/illinois2010spp.pdf accessed on [1/10/11].

[45] *Ibid.*

Jefferson County would not be considered good habitat for the Indiana Bat due to the large amount of residential, industrial, and agricultural areas within the county. However, the county has about 25 percent tree cover with nearly the entire tree species being species where the Indiana bat can be found.[46] An additional four percent of the county is surface water. Both of these land use types may be considered possible foraging areas where the Indiana Bat may be found up to 25 percent of the time.[47] As such, considerations for the Indiana bat's habitat have been included in the analysis.

[46] Pruitt, L. and TeWinkel, T. (ed.), *Indiana Bat (Myotis sodalis) Draft Recovery Plan: First Revision*, U.S. FWS – Region 3, April 2007.

[47] Percentage based on previous discussions between Mr. Mike Coffey (FWS) and Ms. Kristine Davies (Trinity Consultants) for ESA Consultation during previous PSD permitting project.

6. DISCUSSION AND RESULTS

The results from the AERMOD deposition models were then input into equations to find potential impacts to the soil, water, and sediment in the impact area.[48] Three levels of analysis and comparison to ecological screening thresholds were conducted. The first method, which is the recommended scope of analysis provided by the U.S. EPA Region 5, in order to determine if there is an impact to the species of concern, is to add background levels to expected concentrations from the emissions increases associated with the project. The total should then be compared to the appropriate ESL. A second method was used in a number of cases when the background concentrations of the COPC exceeded the ESL without the addition of emissions from the project. In these cases, project increases were compared directly to background data. Finally, as a third methodology of comparison, and in a few cases, an accurate background concentration was not available. In these cases, project increases were compared to TRVs to find an Ecological Screening Quotient (ESQ) as described in section 6.1 of the SLERAP.[49] An ESQ of less than one is considered to have no effect as the estimated exposure level (EEL) will be less than the designated TRV for that COPC. An overall summary of the results is provided in Appendix C to this report.

6.1 PAHs AND HEAVY METAL HAPs

Deposition modeling results for PAHs and metal HAPs were used to calculate media concentrations for soil, water and sediment using the methods described in Section 3.1 of this report. For all modeled COPCs the highest modeled deposition rates, typically found at the facility fence line, were used to determine the media concentration. Please note that using these deposition rates to calculate media concentrations for the media calculations is very conservative because no suitable habitat for the species identified in this analysis exists near the fence line of the facility. Determination of which of the three types of analyses listed above were used depended on whether background media concentrations were available for the pollutants and whether the background concentration was higher than the respective ESL.

The soil concentrations were analyzed by either comparing the calculated concentration versus the given background data or by comparing the total concentration to the ESL. The highest concentration percentage is 0.01% of the background concentration. The highest total concentration percentage is 30.1% of the ESL. In both cases, the PAHs and heavy metal HAPs show no cause for concern for local endangered or threatened species.

Water concentrations were analyzed using all three of the techniques described above. The highest impact found in the analysis is the chromium concentration which was calculated to be 0.06% of the background concentration, significantly below the indicated 1% level where there is potential concern for the local endangered or threatened species.

Sediment concentrations were analyzed using the ESL and ESQ methods listed above. All of the ESQ resulted in no potential concern as all of the calculated ESQ's were very small. The ESL calculated for

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[48] U.S. EPA, Office of Solid Waste. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 1.* EPA 530-D-99-001A. August 1999

[49] U.S. EPA, Office of Solid Waste. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 1.* EPA 530-D-99-001A. August 1999. Pg. 6-1

chromium showed that the concentration added to the background was approximately 43% of the ESL. Therefore, it is not expected to have an impact on local endangered or threatened species.

As detailed above as well as Appendix C, the concentrations do not exceed any of the screening thresholds and all of the impacts are expected along or close to the fence line as shown in Figure 6-1 as well as Table 6-1 where no habitat is available. Therefore, no impacts to endangered or threatened species are expected to occur due to emissions of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chromium, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, or naphthalene from the CTTA expansion project.

6.2 VOLATILE HAPs

Similar to the PAHs and metal HAPs, deposition modeling results for four gaseous compounds were used to calculate soil, water, and sediment concentrations using the methods described in Section 3.2. For all modeled COPCs the highest modeled deposition rates, typically found at the facility fence line, were used to determine the media concentration. Once again, please note that using these deposition rates to calculate media concentrations for the media calculations is very conservative because no suitable habitat for the species identified in this analysis exists near the fence line of the facility. Determination of which of the three types of analyses listed above were used depended on whether background media concentrations were available for the pollutants and whether the background concentration was higher than the respective ESL.

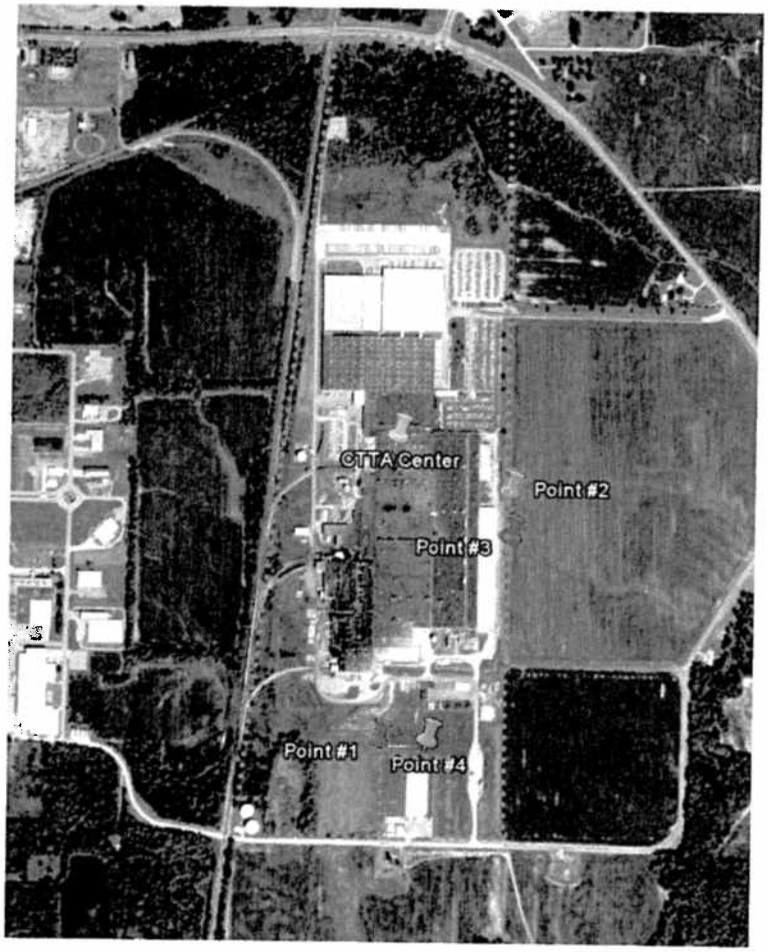
The soil concentrations were analyzed by comparing the computed concentration to known TRVs to calculate an ESQ. None of the pollutant concentrations were significant enough to cause any concern for the local endangered or threatened species.

Water concentrations were analyzed using either the ESL or the ESQ methods of analysis. The highest impact occurred with benzene which was 0.88% of the ESL, mostly due to the background concentration. The COPCs in this analysis show no potential concern to the water supply of the local endangered or threatened species.

The sediment concentrations were analyzed by comparing the calculated concentration to known TRVs to calculate an ESQ. None of the pollutants concentrations were high enough to cause any concern for the local endangered or threatened species.

As detailed above as well as Appendix C, the concentrations do not exceed any of the screening thresholds and all of the impacts are expected along or close to the fence line as shown in Figure 6-1 as well as Table 6-1 where no habitat is available. Therefore, no impacts to endangered or threatened species are expected to occur due to emissions of benzene, methylene chloride, or toluene from the CTTA expansion project.

FIGURE 6-1 – HIGHEST IMPACT POINTS



Property Boundary ·········

Image provided by:
Google Earth.

Annotations by:
Trinity Consultants

TABLE 6-1 – HIGHEST IMPACT POINTS LEGEND

Pollutant	Highest Impact Point (Gaseous Deposition)	Highest Impact Point (Particle Deposition)
Benzene	Point #1	N/A
Methylene Chloride	Point #1	N/A
Toluene	Point #1	N/A
Benzo(a)anthracene	Point #2	Point #2
Benzo(a)pyrene	Point #2	Point #2
Benzo(b)fluoranthene	Point #3	Point #2
Benzo(k)fluoranthene	Point #2	Point #2
Chromium	N/A	Point #4
Chrysene	Point #2	Point #2
Dibenz(a,h)anthracene	N/A	Point #2
Indeno(1,2,3-cd)pyrene	N/A	Point #2
Naphthalene	Point #1	N/A

6.3 OZONE

Based on the maximum potential annual plant-wide emissions of ozone precursors from the proposed expansion, CTTA has estimated that any increases in ozone formation resulting from the site will be minimal [less than 8.70E-05 ppm (0.087 ppb)]. The ozone source apportionment modeling completed in support of the St. Louis 8-hour ozone nonattainment SIP shows that total anthropogenic NO_X and VOM emissions from the St. Louis area contributed to approximately 35 ppb of ozone formation for the worst-case episode modeled (refer to Table 6-5 and Figure 6-8 of the SIP Technical Support Document).[50] The increase in ambient ozone concentration corresponded to an ozone formation potential from anthropogenic sources of 0.067 ppb/tpd for NO_X and 0.11 ppb/tpd for VOM based on the modeled NO_X and VOM emission rates for the 2002 base year (526 tpd and 320 tpd, respectively). CTTA estimated the potential increase in ozone formation attributable to the expansion based on these ppb/tpd ozone formation potentials for the St. Louis area and the maximum ton per day NO_X and VOM emissions rates for the project under the worst-case operating scenario.

In order to determine whether this level of increased ozone in the area surrounding CTTA poses a potential adverse impact to endangered or threatened species, CTTA calculated the three-year average (2006-2008) of this highest three-month W126 statistic within the O_3 season assuming the ozone concentration increase occurred for every hour of the year. The resulting W126 statistic in the form of the proposed secondary NAAQS is 2.20E-05 ppm-hours which represents a negligible fraction of the proposed chronic screening threshold of 7 ppm-hours. A reasonable estimate for a "de minimis impact level" for ozone can be developed based on four percent of the NAAQS consistent with the recent interim 1-hr NO_2 SIL proposed by the U.S. EPA, and therefore, CTTA used 0.28 ppm-hours as a SIL for the direct ozone exposure portion of the soils and vegetation analysis. Since the estimated ozone impact attributable to CTTA is much lower than this proposed SIL, CTTA does not expect the proposed expansion to cause any adverse impacts to endangered or threatened species in the area surrounding the facility due to any ozone formation that may occur from the maximum daily facility-wide NO_X and VOM emissions.

6.4 SUMMARY

Based on the data provided in this report, CTTA has determined that no impact on endangered or threatened species should occur as a result of the proposed expansion project. This conclusion is based on the following information:

- ▲ Foraging habitat surrounding the facility may be available for the Indiana Bat, however, these species are likely to spend only about 25 percent of their time in these foraging areas.
- ▲ Habitat surrounding the facility may be available for the Piping Plover, however, the closest such area is approximately six kilometers away.
- ▲ The media concentrations relative to the ESLs, TRVs, or background data for all COPCs were very low and also occurred primarily along the fence line or very close to the fence line as shown in Figure 6-1 and Table 6-1.
- ▲ The emission estimation approach used in this analysis is conservative; that is, the actual emissions from the project for most COPCs will be substantially less than is shown in this analysis due to the use of extremely conservative AP-42 emission factors.

[50] IEPA Bureau of Air, *St. Louis 8-hour Ozone Technical Support Document*, March 26, 2007.

Appendix A

Recommended Scope of Analysis

Recommended Scope of Analysis for Continental Tire North America, Inc.
Modification for Endangered Species Evaluation
March 1, 2010

Purpose of analysis:

The analysis is intended to determine whether the proposed modifications to the Continental Tire North America, Inc. (Continental Tire) facility located in Mount Vernon, Illinois are likely to directly or indirectly adversely affect federally listed species. This recommended scope of analysis or roadmap recommends using USEPA's ecological risk assessment process to inform the decision points in section 7 of the Endangered Species Act. USEPA's draft Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (EPA 530-D-99-001A) provides useful guidance for this analysis. Although this guidance was designed to assess the impact of hazardous waste combustion facilities it's use is appropriate in this case as we are dealing with many of the same types of chemicals.

Overall, the evaluation should focus on increased emissions from the facility. To complete this analysis we need an understanding of the background concentrations and deposition patterns. The anticipated emissions from permitted but not yet operational facilities should be included in background. The anticipated concentration in air or deposition at sites supporting listed species should be compared against NOEL (No observed effects level) benchmarks thought to be protective of the appropriate group. The evaluation should look at the incremental addition in the context of background concentrations.

Benchmarks:

The anticipated concentration in air or deposition at sites supporting listed species should be compared against NOEL (No observed effects level) benchmarks thought to be protective of the appropriate group (e.g., plants and animals). Where more than one benchmark can be found the most conservative value should be used, unless an explanation is given to justify a less conservative benchmark. When there is no commonly accepted benchmark, there should be a search of the scientific literature for relevant toxicity information to provide a basis for risk assessment for the species of concern.

Modeling protocol:

Modeling should follow the guidance provided in Chapter 3 of USEPA's SLERA protocol. The modeling should show air concentrations and deposition rates for all pollutants. The air emissions resulting from the project should be modeled at the facility level, not on a unit basis. Total impacts should be evaluated looking at the combined effects of the vapor phase, particle phase and particle-bound phase of pollutants. AERMOD is an acceptable model for this analysis.

Background Levels:

Existing soil contamination will be considered in the effects analysis as part of the background.

Suite of pollutants to consider:

The assessment should cover all hazardous air pollutants (metals and dioxin) emitted from the facility. The information provided in the PSD application for this modification is sufficient to address the potential impacts from the criteria pollutant increases resulting from this project.

Types of impact to consider:

1) The indirect effects to animals from ingestion of plants and invertebrates that have accumulated these pollutants.
2) For compounds that may accumulate, evaluate estimated total deposition over life of project. These concentrations should be compared against benchmarks.

Listed Species:

The Indiana Bat potentially occurs within a short distance of the facility, and the Piping Plover may be present during migration.